3.3 Comportment With Technical Reference TR-145

Bellcore's TR-145 describes the general technical characteristics associated with each type of interconnection. This Technical Reference is cited as a reference by most of the LECs in their tariffs, contracts, or other information. While there is no obligation for a LEC to provide all of the types of interconnection noted in TR-145, most of the LECs are at least offering Type 1, Type 2A, and Type 2B. All of the seven Regional Bell Operating Companies (RBOCs) indicate that their offerings comport with TR-145 and they do, given their latitude to deviate from precisely following TR-145. But the manner in which these deviations occur differs between the RBOCs.

Ameritech, Bell Atlantic, BellSouth, Nynex and SBC Communications appear to comply with all of the provisions of TR-145 regarding Type 1, Type 2A, and Type 2B. They place no restrictions on the types of traffic that can be handled by each of the interconnections, other than those already listed in TR-145. Nor do these five companies require any segregation of traffic types for a given type of interconnection.

Pacific Bell also adheres to TR-145 except that it does not permit the routing of calls to Service Access Codes (500, 700, 800, or 900) over Type 2A connections. Pacific Bell requires these types of calls to route via a Type 1 connection.

U S WEST Communications generally conforms with TR-145 but its methodology is different from the other RBOCs in that it has essentially established sub-categories for Type 2A and Type 2B service. For example, separate offerings are described for Type 2A to a local tandem, a toll tandem, and an "ancillary" trunk group. The ancillary trunk group is a one-way trunk used for Operator Services and is actually the equivalent of a Type 1 connection since it routes to an end office instead of a tandem. Type 2B is offered as a

high-use trunk with overflow capability to a Type 2A as well as a direct trunk to a single office without the overflow capability. Similar capabilities are generally available from the other RBOCs but they are not specifically described as they are by U S WEST Communications.

3.4 NXX Codes

As with wireline telecommunication providers, numbers are an extremely important resource to wireless providers. Also like wireline carriers, wireless carriers have an equal right to numbers from the North American Numbering Plan (NANP) as outlined in the Central Office Code Assignment Guidelines (ICCF93-0729-010) that have been agreed to by the industry at the Industry Carriers Compatibility Forum (ICCF) and acknowledged by the FCC. The ICCF is an industry group that addresses various telecommunications issues. Wireless and wireline carriers have an equal responsibility to adhere to the code conservation measures outlined in the ICCF document and Section 3 of the Bellcore publication SR-TSV-002275, "BOC Notes On The LEC Networks 1994."

3.4.1 Availability

Numbers are a national resource and are expected to be made available on an equal basis according to the FCC. This means that all carriers in the telecommunications industry should have an equal right to the numbers and that the criteria for assignment should be the same for all entities. This ideal has not always been carried out in practice but should be more uniform once the new administration procedures being formulated under the auspices of the FCC are implemented.

3.4.2 Activation Time

According to the ICCF document, the effective date for activation of an NXX code should be 105 days from the date of the application. While it is technically possible to activate a code within 60 days of the day Bellcore receives the activation request, the 105 days is a reasonable time and requested codes are expected to be activated within that period of time. Currently, the industry is discussing reducing this 105-day period but no agreement has yet been reached. The discussion has centered on reducing this period to perhaps as few as 45 days.

3.4.3 NPA Exhaust

If and when a new NPA is introduced in an area, all carriers should be included in the planning process instead of just the affected wireline carriers. The relief plan can be in the form of an "overlay," where the new NPA is activated in the same geographical area as the old NPA(s) or the existing NPA boundary can be split to produce a new area for the new NPA code.

If an "overlay" plan is adopted, the FCC has stated that the assignment of numbers from the new NPA should be on a first-come, first-served basis. This is intended to prevent discriminatory actions of having wireless carriers assigned to the new NPA while the wireline customers continue to have assignments in the existing NPA.

3.5 Other Technical Considerations

There are two other technical components that are not always addressed in an interconnection agreement that can result in confusion and customer difficulties if omitted. These pertain to digital synchronization and glare resolution.

3.5.1 Digital Synchronization

When digital devices such as digital switches, or a digital switch and a distant digital multiplexer, are connected, it is very important that the timing of the two devices is synchronized. In most systems, the timing is derived from the line signal at regenerators or terminals of the transmission system. The source is kept within bounds by a control signals transmitted from highly accurate clocks that are located in various parts of the network. The accuracy of a clock is determined by its "stratum" level with "Stratum Level 1 being the highest and Stratum Level 4 the lowest. A primary reference source is a Stratum Level 1 clock, tandems often have a Stratum Level 2 clock, and multiplexers normally have a Stratum Level 4 clock. If the primary source fails, one of the lower level clocks assumes the timing function of the components in the digital network.

Since digital switches are now common in both wireless and wireline networks, the interconnection agreement should state what source will be used for digital synchronization in the event of a failure of the master source. Typically, the LEC tandem has the highest stratum clock but it does not really matter as long as it is understood which company has responsibility for the timing.

3.5..2 Glare Resolution

Glare is the simultaneous seizure of a two-way trunk by both switching machines. In spite of sophisticated trunk-hunting algorithms in each switch, glare occasionally still occurs. In order to minimize service difficulties, the switches need instructions to follow when the

glare situation happens. This instruction is known as a "glare bit" and tells which switch will yield first when a glare condition exists. It does not really matter which switch yields first as long as it is clear which one does so.

Traditionally, the convention has been for the lower-ranked office to yield to the higher-ranked office. Thus, end offices yield to tandems and tandems yield to ICs. Offices of the same rank, i.e., end office to end office, use a low-alpha Common Language Location Identification (CLLI) code technique to determine which office yields first.

For wireless, the same convention can be used. The WSC would yield to the tandem because it is similar to an end office. Again, it does not matter as long as an agreement is reached prior to the implementation of service.

4.0 Regulatory Considerations

Interconnection arrangements have largely resulted from regulatory, not business initiatives. In fact, if not for regulatory actions, interconnection arrangements between carriers would have probably proceeded at an even slower pace than history has shown.

4.1 Federal Communications Commission (FCC) Initiatives

Since 1949 the FCC has issued a series of interconnection decisions whose intent was to create competition within the wireless industry but also define the rights of wireless carriers that interconnect with the LECs.

Initially, the FCC did not order any specific interconnection arrangement and the LECs did not always provide a requested interconnection. Later, some of the LECs provided interconnection but offered more favorable arrangements to their own affiliates or refused

to provide a specific form of interconnection. Over the years, the FCC decisions have addressed these issues and have resulted in establishing some fundamental principles, which are:

(1). Wireless carriers are co-carriers, not end users. They deserve to be treated like other carriers instead of like a subscriber.

(2). LECs must provide tandem (Type 2) interconnection, if requested, and the LECs cannot offer an arrangement that favors their subsidiary.

(3). The FCC has not mandated any particular form of interconnection but has stated that the interconnection agreement must be negotiated in good faith between the parties.

(4). Mutual compensation, which is addressed as a principle in Section 5, is appropriate for certain interconnection arrangements.

(5). The LECs do not "own" telephone numbers and the FCC has plenary jurisdiction regarding numbering disputes.

(6). States cannot regulate the rates charged to subscribers of wireless services.

(7). States have jurisdiction regarding compensation matters although the FCC can preempt a state if the rates are so onerous as to prohibit competition.

(8). Wireless carriers do not have to file tariffs for any interstate rates.

In December, 1995, the FCC issued a Notice of Proposed Rulemaking (NPRM) regarding interconnection policies with respect to compensation between LECs and wireless carriers.

It has tentatively concluded that information regarding interconnection arrangements should be made publicly available. The FCC is seeking further comments on three alternatives regarding implementation of interconnection policies. These are; (1) a federal policy that would directly govern interstate services and serve as a model for states to regulate intrastate services, (2) a federal mandate that would set general parameters which would allow states a range of implementation choices, or (3) specific federal requirements for interconnection that would apply both to interstate and intrastate interconnection. The FCC has proposed an interim "bill and keep" arrangement whereby each carrier would reciprocally terminate calls on its network without charge to the originating network.

4.1.1 FCC Regulatory Classification

In 1994, the FCC issued several decisions in Docket 93-252 which created regulatory parity between those providers operating as common carriers under Part 22 of the FCC's rules and Part 90 private providers when each offered similar services. This decision, which is now included in Part 24 of the rules, resulted in two new classifications called Commercial Mobile Radio Service (CMRS) and Private Mobile Radio Service (PMRS). CMRS providers must meet three basic criteria, which are; (1) service is offered on a "for-profit" basis, (2) service is available to a substantial portion of the public, and (3) the wireless network is interconnected with the Public Switched Telephone Network (PSTN). Any provider not meeting that criteria is classified as a PMRS. As part of that same decision, new PCS licensees are generally recognized as CMRS providers but may petition the FCC to be classified as PMRS if they can show just cause.

CMRS providers are entitled to the same interconnection rights as Part 22 carriers have been granted in a series of decisions dating back to 1949. These include co-carrier status, entitlement to a variety of interconnection arrangements on reasonable terms and

conditions, access to telephone numbers on an equal basis with LECs, and endorsement of the mutual compensation principle.

4.2 State Regulation

Because the states currently have the right to regulate interconnection rates, they are a powerful regulatory force. The states cannot ignore an FCC policy except in cases where compensation is an issue. For example, the states cannot prohibit a LEC from offering a Type 2 connection but the state can approve the rate that is charged for a Type 2 interconnection.

Mutual compensation has been a controversial issue for several years and the controversy will likely increase over the next few years as local service competition is introduced. A number of states have refused to authorize mutual compensation even though the FCC has declared that such compensation is appropriate. In these instances, the states still prevail because it is a compensation issue. Moreover, with the coming of local loop competition, some states are insisting that mutual compensation for wireless carriers is possible only if the carriers subject themselves to the same regulations as existing certified wireline carriers.

Although the FCC preempted the states regarding the right to regulate prices charged by wireless carriers to subscribers, there still remains unresolved issues with respect to entry requirements. States do have the right to issue what is often called a Certificate of Public Convenience (CPN) which authorizes a carrier to do business in a state but that right does not extend to approving rates charged by the wireless carrier.

Some states have chosen not to regulate interconnection rates and simply leave it to the parties for negotiation. Others want to be informed of the results of the negotiation, but do not approve the rates. Still others insist on approving any rates that are negotiated.

Interconnection agreements may be memorialized in a tariff, price list, contract, or some combination of thereof. Some states require a contract for the actual agreement but at least some of the rates may be referenced to existing tariffs. Others require a contract for certain types of interconnection (i.e., Type 2) but use a tariff for other types (Type 1 or private line). Even if both of the parties agree to use a contract, some states have insisted that the agreement is contained in a tariff.

Table 4.1 lists the current state regulatory status. In states where a combination of contracts and tariffs/price lists are used, depending on the type of interconnection, the entry shown in the table refers to Type 2 connections. In addition, the entries refer to the review and/or approval of rates that are specifically for wireless services, like Type 1 or Type 2. The entries do not refer to rates for services, like private lines, that are utilized by end user subscribers as well as wireless carriers.

Table 4.1

State Regulatory Status

State	Review Rates?	Approval Rates?	Contract or Tariff?
Alabama	Yes	Yes	Tariff
Alaska	Yes	Yes	Contract
Arizona	Yes	Yes	Contract
Arkansas	Yes	Yes	Tariff
California	Yes	No	Contract
Colorado	Yes	Yes	Contract

Connecticut	Yes	Yes	Tariff
Delaware	No	No	Contract
District Of Columbia	No	No	Contract
Florida	Yes	Yes	Tariff
Georgia	Yes	Yes	Contract
Hawaii	Yes	Yes	Contract
Idaho	Yes	Yes	Contract
Illinois	Yes	Yes	Tariff
Indiana	Yes	Yes	Tariff
Iowa	Yes	Yes	Tariff
Kansas	Yes	Yes	Tariff
Kentucky	Yes	Yes	Tariff
Louisiana	Yes	Yes	Tariff
Maine	Yes	Yes	Tariff
Maryland	No	No	Contract
Massachusetts	Yes	Yes	Tariff
Michigan	Yes	Yes	Tariff
Minnesota	Yes	Yes	Tariff
Mississippi	Yes	Yes	Tariff
Missouri	Yes	Yes	Tariff
Montana	Yes	Yes	Contract
Nebraska	Yes	Yes	Contract
Nevada	Yes	Yes	Tariff
New Hampshire	Yes	Yes	Tariff
New Jersey	No	No	Contract
New Mexico	Yes	Yes	Contract
New York	Yes	Yes	Tariff
North Carolina	Yes	Yes	Contract

North Dakota	Yes	Yes	Contract
Ohio	Yes	Yes	Contract
Oklahoma	Yes	Yes	Tariff
Oregon	Yes	Yes	Price List
Pennsylvania	No	No	Contract
Rhode Island	Yes	Yes	Contract
South Carolina	Yes	Yes	Tariff
South Dakota	Yes	Yes	Contract
Tennessee	Yes	Yes	Tariff
Texas	Yes	Yes	Tariff
Utah	Yes	Yes	Tariff
Vermont	Yes	Yes	Tariff
Virginia	No	No	Contract
Washington	Yes	Yes	Contract
West Virginia	No	No	Contract
Wisconsin	Yes	Yes	Contract
Wyoming	Yes	Yes	Contract

5.0 Interconnection Principles

A number of interconnection principles have been established over the years by the FCC and other regulatory bodies. Included in these have been the principles of co-carrier status, good-faith negotiation, and mutual (or reciprocal) compensation. Other principles, such as rate stability or confidentiality clauses, are negotiated individually.

5.1 Co-Carrier Status

For almost twenty years, it has been officially recognized that wireless carriers are co-carriers, not end users. This was established in a Memorandum Of Understanding (MOU) that was initially agreed to in 1976 by Radio Common Carriers (RCCs) and AT&T. Later FCC decisions in 1981, 1986, and 1987 reiterated this same principle.

According to the FCC, as co-carriers wireless carriers are engaged in the "...provision of local exchange telecommunications" and should have the same rights as other carriers. The FCC did not specify exactly what these rights include but some states have ruled that co-carrier status includes the basic right to have trouble reports handled in the same manner as other carriers and not as end users.

5.2 Reciprocal Compensation

Particularly with Type 2 connections, the wireless carrier's network provides a switching function and local loop equivalent that replaces those elements in a normal wireline-to-wireline call.

The principle of reciprocal, or mutual, compensation has long been established between LECs and the FCC has endorsed its applicability to wireless carriers in previous decisions. The issue has been addressed in some states with respect to wireless carriers and/or Competitive Access Providers (CAPs). Wyoming originally denied mutual compensation to wireless carriers in 1990 but the Wyoming Supreme court later reversed the PSCs decision. Illinois, Maryland, Massachusetts, and New York have all ordered mutual compensation for CAPs and that same principle may ultimately be extended to other carriers too. In fact, the New York Public Service Commission (NYPSC) has already

ordered Nynex to provide mutual compensation to wireless carriers using Type 2A connections.

While mutual compensation has not been ordered in other jurisdictions, some LECs have provided a recognition of this principle by discounting facilities or services. For example, if a DS1 facility normally costs $500 per month, a LEC might charge a wireless carrier $400 per month in recognition of the fact that about 20% of the traffic on that facility terminates on the wireless carrier's network. While not called mutual compensation, per se, it has the same result if applied to the services and facilities used for interconnection.

As previously stated, the FCC issued a Notice of Proposed Rulemaking (NPRM) in December, 1995, regarding interconnection policies with respect to compensation between LECs and wireless carriers. The ultimate outcome of this NPRM is uncertain but it will definitely affect present compensation methods.

5.3 Cost-Based Rates

Wireless carriers have repeatedly stated that they are willing to pay a fair and reasonable rate for interconnection and have demanded that the rates charged by a LEC should be cost-based. Many LECs propose using of a number of rates that are contained in their Access Services Tariff, which are normally applied to LEC-IC interconnection arrangements. These are cost-supported rates but there remains the question of which rate elements are appropriate and should the rates also contain a contribution element to support local service provided by the LEC.

5.4 Choice Of Facility Providers

Carriers normally have the right to use their own facilities or facilities leased from any authorized carrier to provide the necessary connections within their network in the most economical and efficient manner. These facilities are typically private line arrangements used for non-switched connections, such as a link from a wireless switch to a transmitter or cell site. These links may be leased from a LEC, another service provider, or the carrier may choose to construct their own facilities.

5.5 Contract And Rate Stability

Ideally, all of the components of the interconnection agreement should be contained in the same contract or tariff, but this is usually not the case. Often, contracts or tariffs that are exclusively for wireless have references to other tariffs for certain functions which makes it more difficult to keep track of information. Because of this, many wireless carriers insist on a rate stability clause, or at least the right to receive advance notice of any proposed rate changes.

5.6 Payments

An interconnection agreement often contains specific language regarding payment schedules, penalties, and service interruption allowances. The service interruption allowance varies depending on the type of connection that is interrupted. Usually switched connections, like Type 2, are eligible for a service interruption allowance if the service interruption exceeds four hours. Private line facilities, however, normally have a 24-hour period before a service interruption allowance is paid.

5.7 Confidentiality

Forecasts, types of services ordered, equipment locations, and other data pertaining to the operation of a wireless carrier is often provided to a LEC in the normal course of business. Some of this information is confidential and must not be disclosed to unauthorized persons by the LEC. Consequently, there is often a confidentiality clause in the interconnection agreement.

6.0 Interconnection Rate Elements

The rates in an interconnection agreement are often based on the cost-based rates used in the LEC's Access Services tariffs. These rates contain a number of rate elements and generally, not all of these elements are used to determine the rates for a wireless/wireline interconnection agreement. However, there is no national standard as to which elements must be included or excluded from the interconnection rates that are ultimately negotiated.

This is the most critical part of any interconnection agreement because the interconnection rate can substantially affect the financial viability of any telecommunications business. It is important to understand what rate structure is proposed, what rate elements are included in the structure, the calling scope provided by the proposal, the network architecture of the LEC, and the need of the LEC to maintain parity between service providers. Each point is subject to negotiation and the LECs must negotiate in good faith with the wireless carriers even if the terms and conditions of the interconnection agreement result in the filing of a tariff by the LEC.

Rate elements from the Access Services tariffs are often used by the LECs to establish rates for wireless interconnection because the rates are cost-supported and it helps the LEC maintain parity between services offered to ICs and those offered to wireless carriers. While these services may use different nomenclature, there are many similarities in terms of operation.

There are two basic types of access services, switched access and special access. Switched access covers services that are actually switched by the LEC while special access are private lines having telegraph, voice-grade, digital, video, or audio transmission characteristics.

Usage rates for wireless carriers are often based on either components of the switched access rate elements or sometimes a combination of switched and special rate elements. The special access rate elements are usually the basis for connecting facilities, such as those used for connecting a wireless Point Of Interface (POI) for a Type 2 connection, or may be utilized for private lines connecting the Wireless Switching Center (WSC) to a cell site or another WSC.

The terminology that is used in the following paragraphs is used fairly consistently by the LECs in their access tariffs although some LECs may vary the terminology in certain cases.

6.1 Switched Access Rate Elements

Switched access is comprised of Local Transport, End Office (Local Switching), Residual Interconnection Charge, Chargeable Optional Features, and Common Line rate categories. Figure 6.1 illustrates these access rate elements and the specific elements are discussed in the following paragraphs.

6.1.1 Entrance Facilities

Entrance Facilities are part of the Local Transport rate category and the charge is intended to recover a portion of cost of the transmission path between the POI and the Serving

Wire Center of that POI. This facility may be voice-grade or digital at the DS1 or DS3 level. The Entrance Facility charge consists of a monthly rate that is usually billed on a per termination basis, meaning the monthly charge listed would be doubled because there are two terminations (one at each end of the Entrance Facility).

6.1.2 Local Transport

Local transport may use Direct Trunked Transport or Tandem Switched Transport. Direct Trunks are analogous to Type 2B connections for wireless carriers and may be employed by ICs to end offices or tandems as traffic to those particular locations increases to a level to make such connections economical. Tandem Transport is for traffic routed via an access tandem to an end user location.

The Direct Trunked Transport rates, which are billed on a per-mile basis, usually include Direct Trunked Termination and a Direct Trunk Facility charges. The Direct Trunked Termination rate is used to recover the cost of equipment at each end of the circuit while the Direct Trunk Facility element recovers the cost of transmission facilities between the end points of the circuit.

Tandem Switched Transport charges include Tandem Switching and Tandem Termination components at the tandem switch and a Tandem Switched Facility charge from the tandem to a given end office. The intent of these rate components is as follows:

(a). The Tandem Switching rate is intended to recover a portion of the costs of switching traffic through a tandem and is billed on a minutes of use basis.

(b). The Tandem Switched Termination element, which is billed on a

minutes of use basis, is intended to recover a portion of the costs of circuit equipment used to terminate each end of the Transmission Switched Facility.

(c). The Tandem Switched Facility rate recovers a portion of the transmission facilities between the tandem and the end office. Tandem Switched Facility is billed differently than other elements because it is on a minutes of use plus a per mile basis.

6.1.3 End Office

The End Office category includes the Local Switching and Information Surcharge rate elements.

Local Switching is intended to recover the cost of using the end office switching equipment, terminations in the end office of the end user lines, and termination of calls to recordings in the end office. There are two levels of charges, depending on whether the end office is capable of providing equal access to ICs. Local Switching is billed on a minutes of use basis.

The other element of this category is the Information Surcharge. This charge is based on the total minutes of access used per month and is intended to recover costs associated with the white pages directory listings. This charge is not always applicable to wireless carriers and some LEC tariffs specifically exempt ICs from paying it when calls are terminated to a Type 2 connection.

6.1.4 Residual Interconnection Charge

This is a charge that is intended to recover the costs of the Local Transport (Tandem Switched or Direct) that are not recovered by other charges. It is somewhat of a "catch-all" charge in that it helps the LECs meet a revenue requirement but the exact details of what is included in the Residual Interconnection Charge (RIC) is rather vague. The RIC is billed on a minutes of use basis.

6.1.5 Common Line

Two types of Common Line rate elements are included in the LEC Access Services tariffs. These are the Carrier Common Line (CCL) and the End User Common Line (EUCL).

This charge is intended to recover a portion of the costs of the loop connecting the end user to the end office. The FCC has ruled that such costs are not applicable when a call terminates from an IC onto a wireless carriers network that is connected with the PSTN via Type 2 connections. The rationale for this ruling is that wireless carriers utilizing Type 2 connections provide their own local loop so the CCL element is not appropriate. In many instances it is not billed regardless of the connection type used by the wireless carrier. For ICs, CCL is billed on a minutes of use basis.

The End User Common Line (EUCL) is intended to recover a portion of the local loop that is used for interstate service. It essentially is a subsidy of sorts for universal local service and is billed at a fixed rate per month per line to the end user. Since wireless carriers are not considered end users, this rate is not usually applicable to wireless carriers.

6.1.6 Multiplexing

Multiplexing belongs to the "Chargeable Options" category of switched access rates. This charge would generally apply when a DS3 facility is used as a connecting facility and the

signal needs to be converted to 28 DS1 circuits. It is not usually used for DS1 digital facilities unless the DS1 is used for circuits other than switched access, or in the case or wireless carriers, one or more of the various interconnection types described in Section 2.0. Multiplexing is billed at a fixed monthly rate.

6.1.7 Commonly Used Switched Access Elements

Because the rates for wireless/wireline interconnection are negotiated on an individual case basis, there are a number of possibilities. However, there are usually a common set of rate elements that are included in the wireless/wireline interconnection agreements. These rate elements are typically different, depending on whether the charge is for mobile-land or land-mobile calls. As a caveat, however, the rate elements that are included in the final rate are not always obvious because the contract or tariff may not be completely specific regarding the justification of the final rate.

For mobile-land usage rates, a typical interconnection agreement that uses access charges as a basis may include the Entrance Facility, Local Transport, End Office, and Residual Interconnection Charge elements. The Local Transport portion is usually based on the Tandem Switched Transport rates while the End Office may include only the Local Switching Charge. Usually, the Common Line charges are excluded and often the Information Surcharge element is also not included in the total wireless interconnection rate.

Land-mobile rates often include all of the rate elements, including Common Line and Information Surcharge. Since these plans are optional and replace normal toll charges, the use of all access components is not unreasonable. Nonetheless, the rate for Land-Mobile plans are often considerably cheaper than normal toll rates because of a reduction in the contribution element that is explained in 6.3 below.

6.2 *Special Access Rate Elements*

Special access services offer a number of facilities with different transmission characteristics and are used for a variety of purposes. There are a number of rate elements that can be included for special access services but the elements that are typically included in a wireless/wireline agreement are the same as those used for a two-point private line service. These two-point private lines may be a voice-grade analog channel but more frequently are digital facilities at the DS1 (24 voice-grade equivalent channels) or DS3 rate (672 voice-grade equivalent channels). The three rate elements for these circuits are Channel Termination, Channel Mileage Terminations, and Channel Mileage Facility charges.

It is also possible that a fourth element, Multiplexing, is appropriate for these types of circuits. This charge is similar to the multiplexing charge described above for switched access service.

Figure 6.2 depicts the special access rate elements for a typical two-point private line circuit.

6.2.1 Channel Termination

The Channel Termination charge is used order to recover the cost of the transmission facility between the POI and the Serving Wire Center (which is the end office that terminates that actual facility serving the POI). Since there are two ends of the circuit, there are usually two Channel Termination charges imposed for any given circuit. The Channel Termination charge is billed as a fixed rate per month.

6.2.2 Channel Mileage Facility

In some LECs, this charge is known as an Interoffice Facility Charge. It is intended to recover the cost of facilities between the two Serving Wire Centers in the circuit. Not all circuits have two SWCs since it is possible that the two POIs could be served by the same SWC. However, in cases where the there are two distinct SWCs, a Channel Mileage Facility charge is imposed. Channel Mileage Facility charges are billed monthly on a per-mile basis.

Logically, the facility charge increases as the transmission rate increases so that a single DS1 facility is much cheaper than a single DS3 facility. However, the sum total for 28 DS1 circuits, which is the electrical equivalent to a DS3, is much greater than the cost of a single DS3. The economic cross-over point for this type of arrangement varies but typically is around 5-7 DS1 circuits before a DS3 is more economical.

6.2.3 Channel Mileage Termination

Used in association with the Channel Facility Mileage charge, the Channel Mileage Termination charge is used to recover the cost of circuit terminating equipment in the SWCs and any intermediate offices. It is billed monthly on a fixed rate basis.

6.2.4 Commonly Used Special Access Rate Elements

All three of these special access rate elements are often included in rates for wireless/wireline interconnection. The terminology may vary because some of the LECs use rates from their Private Line tariffs, which resemble special access but do not always use the same terminology.

Some LECs, notably Nynex, do not include specific facility charges for facilities used to connect Type 2 facilities but will use these components for the private line links between the WSC and cell sites.

6.3 Contribution Element

Rates charged by the LECs recover the basic cost of the component plus provide a profit for the LEC. But most of the rates charged by the LECs also contain a Contribution element which is an additional charge added to the rate that is used to support local exchange service. This extra charge can range from 10% to 3000% with 40-50% being a typical amount.

The inclusion of a Contribution element is normally one of the more contentious issues in the negotiation process. As a co-carrier, the wireless carriers believe they should not have to pay an additional price simply to support another co-carrier's service. In some states, such as North Carolina, this argument has been accepted. In other states, the contribution level is reduced for wireless carriers but not entirely eliminated.

6.4 Regional Bell Operating Company (RBOC) Rate Structures

Each LEC included in the study has its own rate structure for wireless/wireline interconnection arrangements. As a matter of illustration, only some of the LEC rate structures are described in the following paragraphs. These LECs are owned by the Regional Bell Operating Companies (RBOCs) and represent the largest, aside from GTE, entities in the United States.

Only the rate structures for determining the monthly recurring charges for Type 1 and Type 2A interconnections are described. Most of the LECs, but not all, use a different

rate structure for Type 1 service than Type 2A. Moreover, while the rates for both types of connections may be based on access service elements, it is not always clear which elements have been included in the final rate. In addition, the nomenclature that is used is by no means identical between the various LECs.

6.4.1 Ameritech

As shown in Figures 6.3 and 6.4, Ameritech uses different rate structures for Type 1 and Type 2A connections. Also these structures are not entirely consistent throughout the five Ameritech states. The description below refers to Illinois.

The rate structure for Type 1 service is rather simple but the result is, on average, a much higher rate than that for Type 2A. If the Serving Wire Center (SWC) is different than the end office that provides the Type 1 connection (which is the case in Figure 6.3), a Channel Mileage charge is imposed for the facility between the SWC and the end office. Otherwise there is only a Carrier Dedicated Channel (CDC) charge without any mileage component. At the end office switch, there is just a Switch Termination charge. Instead of a Minutes Of Use (MOU) charge, Ameritech charges normal message-unit charges for Type 1. These vary with locality but generally average about $0.05, which is considerably higher than the Type 2A MOU rate.

Type 2A charges in Ameritech, as illustrated in Figure 6.4, have several elements. For transport, either a combination of a Carrier Dedicated Trunk (CDT) and Carrier Common Trunk (CCT) or Dedicated Trunk Transport (DTT) elements are used. The CDT and DTT components are rated like a private line DS1 facility while the CCT portion is a banded, mileage-sensitive MOU charge. In addition, regardless of whether direct or tandem transport is used, there is a Carrier Line Switching (CLS) element that is also based on minutes of use.

6.4.2 Bell Atlantic

Bell Atlantic uses some access service rate elements for both Type 1 and Type 2A but the rate structures are not the same for the two types of connections. The rate structures are fairly consistent throughout Bell Atlantic's seven jurisdictions although the description below is for Virginia.

For Type 1, there is a Connecting Facility charge from the Point Of Interconnection (POI) to the end office. This is based on normal DS1 rates and includes Channel Termination, Channel Mileage and Fixed Mileage components. If the end office is not the SWC, as shown in Figure 6.5, additional Channel Mileage charges apply. At the end office, there are three other charges, which are for Central Office Equipment, Type 1 Surcharge, and Message Trunk. Normal message unit charges are used instead of an MOU-based structure.

There are no separate facility charges in Bell Atlantic for Type 2A. Instead, the cost is recovered via a banded MOU for Local Transport. The actual mileage is from the SWC of the POI to the end office where the call terminates but essentially the cost of the loop between the POI and the SWC is also recovered. Another MOU-based component is Local Switching while a fixed monthly Trunk Rate, per trunk, is also imposed. Total charges for Type 2 are considerably less than those for Type 1. Moreover, Type 2B charges are less than Type 2A charges.

6.4.3 BellSouth

BellSouth uses the same rate structure for both Type 1 and Type 2A connections. Essentially, a Connecting Facility charge using common DS1 rate elements, Channel